Michal DUDEK, MSc, PMP
Project Manager, SRE, Software Engineer

www.dudek.tech
/in/dudek-michal/
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years old

Curriculum Vitæ

Personal Profile

A project manager who's able to assimilate large quantities of information, identify the key issues and organize a clear strategy and transform it into goals and objectives within the team. A valuable member of an organization, focused on achieving results in highly pressurized, challenging and international working environments.

An open-minded engineer with a broad knowledge of site reliability engineering, software engineering, modern IT solutions and a large-scale, high-availability, distributed control systems. Has 9 years of experience in the design, development and maintenance of software, hardware and IT infrastructure for a real-time and industrial control systems running 24/7 operations. Committed, organized and conscientious, providing quality results. General manner problem-solver who instigates and promotes changes as an opportunity for constant improvement of the systems. Produces workable and timely solutions that conform to requirements.

Professional Experience

2013 – 2018 **Project Manager & Site Reliability Engineer, CERN, Switzerland**
Technology Department, Electrical Power Converters Group

Project management:
- gathering high-level information on the project;
- defining project objectives, key deliverables and measurable success criteria;
- identifying stakeholders and capturing their needs, constraints and expectations;
- performing functional analysis of requirements for the new control systems;
- determining development approach and developing project management plan;
- directing and managing controls related projects (software, hardware, infrastructure);
- managing budget, procurement and contracts;
- ensuring quality, security and safety;
- coordinating work of teams, monitoring and controlling progress;

Team management:
- driving continuous improvements to the engineering workflow;
- deploying, configuring and integrating team management and software development tools;

Software development and control systems engineering:
- defining systems design;
- selecting proper software & hardware solutions;
- determining appropriate implementation strategy;
- deciding on pertinent documentation approach;
- defining test policies and establishing procedures;
- developing, deploying, configuring, integrating and commissioning control systems;
- disseminating knowledge and informing others of the practices to be implemented;

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Professional Experience (continued)

Maintenance & 24/7 operational support for the critical high-availability systems:

- maintaining 2500+ production control systems;
- configuring, integrating and maintaining 35 GNU/Linux production servers;
- driving continuous improvements of the existing systems;
- developing, deploying and integrating software tools for infrastructure management;
- providing user support, technical expertise and advice;

2010 – 2013 **Software Engineer & Control Systems Engineer, CERN, Switzerland**
Technology Department, Cryogenics Group

Software development and control systems engineering:

- designing software & hardware architecture;
- developing, deploying, configuring, integrating and commissioning control systems;
- automating repeatable tasks with software tools;
- incorporating continuous integration (CI) system into software development workflow;

Education

2005 – 2010 **AGH University of Science and Technology, Cracow, Poland**
Faculty of Electrical Engineering, Automatics, Computer Science and Electronics
Master of Science in engineering (M.Sc.Eng.): Electrical Engineering, Computer Engineering for Industrial Applications

Projects

2014 – 2018 *The Extra Low Energy Antiproton ring (ELENA) at CERN*

The ELENA ring at CERN was a complex project with a purpose to build a new machine to enhance the studies of antimatter. As a project leader of the powering work package, my objective was to provide power converters together with associated control systems & IT infrastructure for the ELENA ring magnetic system and auxiliary apparatus. In order to achieve that, I had to communicate and coordinate with more than 120 people from diverse scientific and cultural backgrounds. My responsibility was to negotiate and combine various perspectives and chose the best solution and strategy for the team and the project. The activity included organization and coordination of the installation and commissioning of the hardware and the software, as well as putting the machine into operation. In total, 460 power converters were delivered. The overall project budget was 30 millions Swiss francs and I was responsible for 1.7 million Swiss francs.

Project Management | Leadership | Communication | Negotiation | Active Listening | Cultural Awareness | Teamwork | Budget | Strategic Planning | Strategic Thinking | Executing | Monitoring | Controlling | Complexity | Technology | Innovation

2014 – 2018 *Software enhancements and modern monitoring solutions for a large-scale, high-availability distributed control systems at CERN*

My mandate as a technical leader of a project, site reliability engineer and a senior software engineer at CERN was to maintain C++ real-time software for a large-scale, distributed control systems for 2500+ power converters running 24/7 operations. The responsibilities included software upgrades based on the analysis of requirements of the machines operation team, as well as integration, configuration and maintenance of 35 GNU/Linux production servers. The objective of the project was to increase the availability of the machines, eliminate the errors experienced by the on-call service and implement modern monitoring solutions based on the Elasticsearch stack and Grafana. As a result, the reliability of the complex increased by 20%.

Project Management | Strategic Planning | Technical Leadership | Site Reliability Engineering | Software Engineering | Large Scale | High Availability | Distributed Systems | Critical Infrastructure | Complexity | Technology | Testing

Projects (continued)

2017 – 2018 *Power converters control system for the medical laboratory at CERN*

The CERN-MEDICIS is a facility that develops unique isotopes for medical diagnostics and therapy. To keep it operational, constant supply of the energy for the beam line apparatus is essential. As a technical leader of a project and a senior software engineer, I was responsible for the design, development and commissioning of a distributed control system for the power converters. The main purpose of the activity was to provide the ability to remotely control the equipment connected to industrial control systems, as well as create a unified and secure software interface to integrate the devices with CERN accelerator controls. The control architecture was deployed using C++, Front End Software Architecture (FESA) framework and Siemens S7 PLCs. The first particle beam was observed in Q4 2017 and the control system is operational since then.

Project Management | Technical Leadership | Software Engineering | Distributed Systems | Technology | Innovation | Testing

2017 – 2018 *State machine for the static VAR compensator (SVC) station for the Large Hadron Collider (LHC) at CERN*

The purpose of building static VAR compensator station for the LHC was to provide fast-acting reactive power on high-voltage electricity transmission networks, therefore improving power quality and reducing cost of electricity. I was responsible for the design, development and commissioning of an industrial control system based on Siemens S7 PLCs and WinCC-OA SCADA. My objective as a technical leader of a project and a senior software engineer was to deploy a secure and fully automated state machine for managing 18kV switches and Thyristor Controlled Reactor (TCR) of the 24MVAR SVC station. The project was a success and the machine is operational since Q1 2018.

Project Management | Technical Leadership | Software Engineering | High Availability | Critical Infrastructure | Technology

2013 – 2014 *Magnetic field control system for the radioactive isotopes research laboratory at CERN*

The ISOLDE facility is one of the world's leading laboratories for the production and investigation of a radioactive nuclei. To supply the particle beam to the experiments without any interruptions, stable electric and magnetic fields have to be assured in many elements of the beam line. As a technical leader of a project and a software engineer, I was responsible for the design, development and commissioning of a magnetic field control system. The objective of the activity was to achieve optimal field precision and stability for the magnets, using existing controls infrastructure in the laboratory. The field regulation algorithm was implemented using C++ and Front End Software Architecture (FESA) framework. The final control solution consisted of a master real-time control system calculating regulation errors and transmitting requests to Siemens S7 PLC based industrial control system.

Project Management | Technical Leadership | Software Engineering | Magnetic Field | Regulation | Testing | Commissioning

2012 – 2013 *Software enhancements for the cryogenic control system of the Large Hadron Collider (LHC) at CERN*

The purpose of the project was to increase the availability of the cryogenic system of the LHC and ease the standard operating procedures. The software control upgrades based on feedback and new requirements of the machine operation team. The improvements mainly concerned cryogenic process regulation loops, software logic, as well as automating repeatable operational tasks with software tools. The enhancements were deployed on Siemens S7 PLCs and WinCC-OA SCADA.

Technical Leadership | Software Engineering | Continuous Integration | Distributed Systems | Cryogenics | Instrumentation

Projects (continued)

2010 – 2012 *Cryogenic control systems for the superconducting elements test facility (SM18) at CERN*

The goal of the project was to deploy a control systems responsible for managing shared infrastructure, as well as regulation of the cryogenic processes in vertical cryostats. In my role as a software engineer, I was responsible for the design, development and commissioning of an industrial control systems located at Block 4 in SM18. My objective was to provide a software logic and a regulation algorithms in order to ensure stable cryogenic environment – helium bath at 4.5K, as well as super-fluid helium bath at 1.9K – for the research and development of various critical components of the LHC accelerator. The tests mainly concerned superconducting prototype magnets, LHC cold by-pass diodes and high temperature superconducting (HTS) current leads. Ultimately, the deployed control solutions involved Siemens S7 PLCs and WinCC-OA SCADA.

Technical Leadership | Software Engineering | Distributed Systems | R+D | Cryogenics | Regulation | Testing | Commissioning

Professional Trainings

Personal Development Courses

2020 PMP Exam Prep Seminar (35h);
2017 Increase personal awareness to maximize performance (24h);
2016 Handling difficult conversations (24h);
2016 Balancing performance and pressure (16h);
2015 Procurement and contract management training on supplies (8h);
2013 Communicating effectively (24h);

Computer Science Courses

2019 Mastering Data Structures & Algorithms using C and C++ (56h);
2018 Python: Introduction (16h);
2018 Modern C++: Making the most of the 11/14 standards (32h);
2018 C++ Part 3: Generic programming in C++ and the STL (16h);
2016 C++ Part 2: Object-oriented programming (24h);
2014 C++ Part 1: Introduction (32h);
2013 Developing secure software (3.5h);
2008 Cisco CCNA;

Knowledge & Skills

Personal Qualities

Leadership | Management | Multitasking | Communication | Negotiation | Active Listening | Emotional Intelligence | Patience
Problem Solving | Analytical Reasoning | Critical Thinking | Attention to Detail | Perseverance | Teamwork | Cultural Awareness

Computer Science, Electronics and Controls

GNU/Linux | Bash | C/C++ | PHP | SQL | Data Structures | Big O | HTML | JSON | XML | CSS | GIT | SVN
Systems Design | Networking | Back-End | Nginx | Jenkins | ELK stack | Grafana | MariaDB | JIRA | Matlab
Embedded Systems | Siemens PLCs | Profibus | Profinet | SCADA | WinCC-OA | UNICOS | FESA

Languages

Polish (native) | English (fluent) | French (elementary) | German (elementary)